

**CLAIMS**

What is claimed is:

- 5        1. An isolated polypeptide, wherein said polypeptide comprises an amino acid sequence comprising SEQ ID NOs:1, 2, 3, 4 and 5.
- 10      2. The polypeptide of claim 1, wherein said polypeptide comprises 350 amino acid residues.
- 15      3. The polypeptide of claim 1, wherein said polypeptide is selected from the group consisting of at least 30% sequence identity with SEQ ID NO:7 or 8, at least 50% sequence identity with SEQ ID NO:7 or 8, at least 70% sequence identity with SEQ ID NO:7 or 8, and at least 70% sequence identity with SEQ ID NO:7 or 8.
- 20      4. The polypeptide of claim 3, wherein said polypeptide is human.
5. The polypeptide of claim 1, wherein said polypeptide is a sperm-specific membrane protein.
- 25      6. The polypeptide of claim 1, wherein said polypeptide has Band 5 protein activity.
7. A pharmaceutical composition comprising one or more polypeptide of claims 1-6 and a pharmaceutically acceptable carrier.
8. An isolated nucleic acid comprising a nucleic acid sequence encoding a polypeptide according to any of claims 1 to 6.
9. An antibody directed against a polypeptide according claims 1 to 6.
- 30      10. The antibody of claim 9, wherein said antibody inhibits the activity of said polypeptide, or a fragment, derivative, or modification thereof.

11. A pharmaceutical composition comprising an antibody according to claim 9 or claim 10, or a fragment, derivative, or modification thereof.
- 5        12. A method of contraception, said method comprising administering to a subject a pharmaceutical composition comprising an effective amount of an antibody of claim 9, wherein said antibody reduces conception.
- 10        13. A method of inhibiting Band 5 protein activity in a mammal, said method comprising administering to said mammal an effective amount of an inhibitor of Band 5 protein activity, thereby inhibiting Band 5 protein activity in a mammal.
14. The method of claim 13, wherein said activity is kinase activity.
- 15        15. The method of claim 13, wherein said inhibitor of Band 5 protein activity is administered via a route selected from the group consisting of topical, oral, rectal, vaginal, intramuscular, and intravenous.
- 20        16. The method of claim 15, wherein said inhibitor of Band 5 protein activity is administered via a topical route.
17. The method of claim 13, wherein said inhibitor of Band 5 protein activity binds with Band 5 protein or a homolog or fragment thereof.
- 25        18. The method of claim 17, wherein said inhibitor is an antibody.
19. The method of claim 18, wherein said antibody is selected from the group consisting of a polyclonal antibody, a monoclonal antibody, a humanized antibody, a chimeric antibody, and a synthetic antibody.
- 30        20. A composition comprising an antibody that specifically binds with Band 5 protein, or a homolog or fragment thereof, and a pharmaceutically-acceptable carrier.

21. The composition of claim 20, wherein said Band 5 protein is selected from the groups of proteins which shares at least 30%, at least 50%, at least 60%, at least 70%, at least 80%, and at least 90% sequence identity with SEQ ID NO:7.
- 5       22. The composition of claim 20, wherein said Band 5 protein is selected from the group of proteins which shares at least 30%, at least 50%, at least 60%, at least 70%, at least 80%, and at least 90% sequence identity with SEQ ID NO:8.
- 10      23. A composition comprising an isolated nucleic acid complementary to a nucleic acid encoding a Band 5 protein, or homolog or fragment thereof, said complementary nucleic acid being in an antisense orientation, and a pharmaceutically-acceptable carrier.
- 15      24. A method of inhibiting Band 5 protein synthesis in a mammal, said method comprising administering to said mammal an effective amount of an inhibitor of Band 5 protein synthesis, thereby inhibiting Band 5 protein synthesis in a mammal.
- 20      25. The method of claim 24, wherein said inhibitor of Band 5 protein synthesis inhibits translation of Band 5 mRNA.
26. The method of claim 25, wherein said inhibitor of Band 5 protein synthesis binds with Band 5 mRNA.
- 25      27. The method of claim 26, wherein said inhibitor of Band 5 protein synthesis which binds with Band 5 mRNA is an antisense oligonucleotide.
- 30      28. The method of claim 24, wherein said inhibitor is administered via a route selected from the group consisting of topical, oral, rectal, vaginal, intramuscular, and intravenous.
29. The method of claim 28, wherein said inhibitor is administered via a topical route.

30. A method of identifying a compound which regulates Band 5 protein synthesis, or a homolog thereof, in a mammal, said method comprising administering a test compound to said mammal and comparing the level of Band 5 protein in said mammal with the level of Band 5 protein in an otherwise identical mammal not administered said test compound, wherein a different level of Band 5 protein in said mammal administered said test compound, compared with said level of Band 5 protein in said otherwise identical mammal not administered said test compound, is an indication that said test compound regulates Band 5 protein synthesis in said mammal, thereby identifying a compound which regulates Band 5 protein synthesis in a mammal.
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31. A compound identified by the method of claim 30.
32. The compound of claim 31, wherein said compound is an inhibitor of Band 5 protein synthesis in a mammal.
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33. A method of identifying a compound which regulates Band 5 protein synthesis, or a homolog thereof, in a cell in vitro, said method comprising administering a test compound to said cell in vitro and comparing the level of Band 5 protein in said cell in vitro with the level of Band 5 protein in an otherwise identical cell in vitro not administered said test compound, wherein a different level of Band 5 protein in said cell in vitro administered said test compound, compared with said level of Band 5 protein in said otherwise identical cell in vitro not administered said test compound, is an indication that said test compound regulates Band 5 protein synthesis in said cell in vitro, thereby identifying a compound which regulates Band 5 protein synthesis in a cell in vitro.
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34. A compound identified by the method of claim 33.
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35. The compound of claim 34, wherein said compound is an inhibitor of Band 5 protein synthesis in a cell in vitro.
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36. A method of identifying a compound which regulates activity of Band 5 protein or a homolog thereof, in a cell in vitro, said method comprising administering a test

- compound to said cell in vitro and comparing the level of Band 5 protein activity in said cell in vitro with the level of Band 5 protein activity in an otherwise identical cell in vitro not administered said test compound, wherein a different level of Band 5 protein activity in said cell in vitro administered said test compound, compared  
5 with said level of Band 5 protein activity in said otherwise identical cell in vitro not administered said test compound, is an indication that said test compound regulates Band 5 protein activity in said cell in vitro, thereby identifying a compound which regulates Band 5 protein activity in a cell in vitro.
- 10 37. A compound identified by the method of claim 36.
38. The compound of claim 37, wherein said compound inhibits Band 5 protein activity.
- 15 39. A method of identifying a compound which regulates activity of Band 5 protein or a homolog thereof, in a mammal, said method comprising administering a test compound to said mammal and comparing the level of Band 5 protein activity in said mammal with the level of Band 5 protein activity in an otherwise identical mammal not administered said test compound, wherein a different level of Band 5 protein activity in said mammal administered said test compound, compared with  
20 said level of Band 5 protein activity in said otherwise identical mammal not administered said test compound, is an indication that said test compound regulates Band 5 protein activity in said mammal; thereby identifying a compound which regulates Band 5 protein activity in a mammal.
- 25 40. A compound identified by the method of claim 39.
41. The compound of claim 40, wherein said compound is an inhibitor of Band 5 protein kinase activity.
- 30 42. A method of diagnosing a fertility problem in a test subject, said method comprising administering to a test subject an antibody against a polypeptide of claim 1 to 6, measuring the level of said polypeptide, wherein a difference in the level of

said polypeptide in said test subject, relative to the level of said polypeptide in a control subject, indicates a fertility problem in said test subject.

43. A method of contraception, said method comprising administering to a subject  
5 an effective amount of an inhibitor selected from the group consisting of inhibitors of Band 5 nucleic acid synthesis, Band 5 protein synthesis, and Band 5 protein activity.

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